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Fishing grounds for a possible deep-sea fishery west of the British Isles

In 1974 the fishery research ship the "Walther Herwig" made its first trip to investigate the fish stocks on the continental slope of western Europe and its outlying banks. As part of this so-called "deep-sea fishery program", established to find alternatives for the German deep-sea fishery fleet in the face of the already foreseeable decline in fishing opportunities, two more trips were made in 1974 and 1975 under the direction of the Institut für Fangtechnik (Institute for Fishing Technology).

After a three-year interruption, the Institut für Seefischerei (Institute for Ocean Fishery) resumed the "deep-sea fishing trips" in 1979; the Institute had also been involved with the previous trips. By 1983, five more voyages had taken place to ascertain the seasonal distribution of commercially valuable species of fish and to work out the biological parameters necessary for exploitation of the stocks. The program will be terminated in 1984, with the exception of studies on blue ling stock.

The preliminary results obtained from each trip were presented in brief in this journal (Freytag and Mohr, 1974; Mohr and Freytag, 1975; Wagner and Stehmann, 1974; Ehrich and Cornus, 1979; Ehrich, 1980; 1981; 1982). More comprehensive papers were submitted by Ehrich (1983), dealing with the occurrence of commercially important species as a function of water depth and water temperature, and by Rätz (1984),

concerning the qualitative and quantitative composition of the community of fishes in the Rockall Trough.

The present paper is undertaking to use the results from the eight voyages that have been made to provide information on which commercially important species can be expected at the various fishing grounds over the course of a year and to demonstrate the importance of the various fishing areas from a commercial point of view. Since the fishery was not carried out under commercial conditions, statements giving the average quantities landed per fishing ground or depth range, for example, would lead to erroneous assessments, since some worthwhile accumulations of fish congregate in a very restricted area within a fishing ground (bank) over a period of several weeks. The fishing grounds are evaluated using the maximum catches for the various seasons of the year. Unfortunately, we simply have to tolerate the subjectivity that may result from using this approach.

The 140' and 200' bottom trawls were used for the first three voyages (W.H. 10, 14, 170); the next five voyages did not use the 140' net, only the 200' net (W.H. 34, 38, 47, 50, 58). The average width of the trawl opening (distance between the wing tips) was about 22 m for the 140' net and about 21 m for the 200' net, while the average height of the trawl opening measured 3.7 m for the former and 5.5 m for the latter.

Bridger has shown the locations and names of the various fishing grounds (1978). This enables a direct comparison with British studies carried out using three ships making 6 trips from 1973-1974. Fig. 1 shows the area covered by the studies and the locations of the areas fished. Table 1 shows the time periods for the eight trips,

Table 2 the number of hauls made and the depth ranges and fishing grounds in which these hauls were made. This study concentrates on six species of fish that have either been taken for some time now by the German fleet (e.g. blue ling (Molva dypterygia) and hake (Merluccius merluccius)) or species for which marketing possibilities are envisaged (e.g. grenadier (Coryphaenoides rupestris), black scabbard fish (Aphanopus carbo), greater silver smelt (Argentina silus) and "Granatbarsch" (Hoplostethus atlanticus)).* The fishing grounds off the continental slope are described from south to north.

a. South Farm Bank

South Farm Bank is located at the southern edge of the blue ling distribution area. Only isolated specimens of blue ling were found there. Grenadier catches were only average (max. 1300 kg/hour) even in the best season (January and February). Catches of black scabbard, greater silver smelt and hake were small every season. The best catch of Hoplostethus atlanticus made at this fishing ground was made in January at 1 000 m (1140 kg/h). This success was never repeated at South Farm, however, with other hauls made here under 20 kg/h.

b. Porcupine Bank

Some of the catches made at Porcupine Bank are considerably larger than those from South Farm Bank, e.g. large quantities of

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*Translator's note: No English translation could be found for the German "Granatbarsch"; the Latin name (Hoplostethus atlanticus) has therefore been used throughout. Hoplostethus mediterraneus was found and is given in English as "rosy soldier fish", so that it would appear the "Granatbarsch" may be some kind of soldier fish itself.

greater silver smelt were caught here at about 400 m in February and June (max. 3800 kg/h). The blue ling catch was extremely small, but hake catches were very good here compared with all the other fishing areas (max. 330 kg/h at 400 m). Grenadier catches made in February (max. 1600 kg/h at 1000 m) were only slightly larger than the hauls taken at South Farm Bank; the same was true of the quantities of black scabbard caught in May (max. 260 kg/h at 1000-1200 m). Hoplostethus atlanticus can be caught on a very regular basis here at 1000-2000 m, even though the maximum catch, at 370 kg/h, was smaller than that from South Farm Bank.

c. Tory

The largest catches of grenadier in the entire region (max. 3350 kg/h) were made in this fishing area, with the best months May and October and the optimal depth range 800-1000 m. At max. 80 kg/h and max. 470 kg/h respectively, blue ling and black scabbard catches were larger than those made in the more southerly fishing grounds, while hake and Hoplostethus atlanticus catches were smaller (max. 140 kg/h and max. 280 kg/h, respectively). The largest reduction was in greater silver smelt (max. 30 kg/h).

d. Barra

Larger catches of blue ling and greater silver smelt were made at the Barra fishing grounds (blue ling: May, max. 170 kg/h at 630 m; greater silver smelt: October, max. 130 kg/h, at 400 m). The catches of the other four species decreased, however. The maximum grenadier catch made in October at 750 m amounted to only 1300 kg/h.

e. Flannan

Very good black scabbard catches (max. 1830 kg/h) were made on the continental slope off the Flannan Isles in February and March. Catches of greater silver smelt (max. 1550 kg/h) and blue ling (max. 500 kg/h) continued to increase, whereas grenadier catches (max. 1000 kg/h) continued to decrease in comparison with catches made farther south. Hake catches at 600 m were very large in January (max. 710 kg/h). In contrast to the Barra fishing grounds, the catches of Hoplostethus atlanticus rose again to max. 70 kg/h.

f. Sulisker

Greater silver smelt catches were very good at Sulisker in January and June (max. 3000 kg/h at 400-600 m). Blue ling catches at 800 m reached a maximum of 900 kg/h between February and May. At max. 1500 kg/h, catches of black scabbard were largest in May and June and at a depth of 700-900 m. Grenadier catches made here were the smallest in the entire study area (max. 600 kg/h). Hake catches were also small (max. 120 kg/h), and no Hoplostethus atlanticus were found at these fishing grounds.

g. Rosemary Bank

Rosemary Bank is very important for two species of fish: Hoplostethus atlanticus and black scabbard. Quantities of the former caught here (max. 1050 kg/h in May at 1000-1200 m) were similar to quantities caught at South Farm Bank. Quantities of black scabbard caught here were the largest made; they went as high as 3700 kg/h in

May and June at 600 m. Blue ling catches made here (max. 120 kg/h) were very small in comparison with the catches from adjacent fishing grounds, as were the catches of greater silver smelt (max. 12 kg/h). The best grenadier catches amounted to about 500 kg/h and no hake were found at Rosemary Bank.

h. Bill Bailey's Bank

Catches of blue ling (February-May; max. 750 kg/h) and greater silver smelt (max. 680 kg/h) from Bill Bailey's Bank were comparable to those made at Sulisker. Greater silver smelt catches were max. 2200 kg/h and black scabbard catches max. 520 kg/h. In contrast to Rosemary Bank, there were only isolated specimens of Hoplostethus atlanticus and no hake were found here.

i. Lousy Bank

Lousy Bank is of particular interest from a fishery point of view since blue ling come there to spawn in February and March. As a result, the catches made in those months were much larger than the catches made at other fishing grounds and other seasons. The "Walther Herwig" caught as much as 4000 kg/h of ready-to-spawn blue ling, but only on the southwesterly slope of the bank, at 700-900 m. The catches descreased from about March on.

In contrast, good grenadier hauls were made all year long (max. 2000 kg/h at about 800 m). Greater silver smelt catches had continued to decline (max. 1200 kg/h) and black scabbard catches were very small (max. 80 kg/h). No hake were found at this bank and only isolated specimens of Hoplostethus atlanticus.

k. George Bligh Bank

Neither hake nor Hoplostethus atlanticus were found here and catches of black scabbard and greater silver smelt were very small (max. 38 kg/h and max. 350 kg/h, respectively). The best blue ling catches (max. 240 kg/h) were made in February at Bligh Bank too, although they were always much smaller than catches from Lousy Bank. Grenadier catches from Bligh Bank were also smaller (max. 1200 kg/h in October at 800-1000 m).

l. Rockall Bank

There were no hake in any of the catches made anywhere in the area of Rockall Bank and only isolated specimens of Hoplostethus atlanticus in the hauls. Grenadier catches continued to decline and were max. 980 kg/h at 800-1000 m at the beginning of the year. Black scabbard were not important here either (max. 130 kg/h) and even blue ling account for only a small proportion of the catch (max. 170 kg/h at 550 m in February). In contrast, catches of greater silver smelt were considerably larger at Rockall Bank than at the more northerly banks (max. 2400 kg/h in January at 400-500 m).

In contrast to Bridger (1978), our summary of the results for the six species of fish is as follows:

In February, at the beginning of the spawning season, blue ling congregate in large spawning concentrations at Lousy Bank. The main spawning area changes in the following months, until May, and the remunerative concentrations also shift eastward over the southern slope

of Wyville Thomson Ridge (Ymir Ridge) to the slope of the Hebrides Shelf. Bridger did not examine the northerly banks during the spawning season; he also had no fish with ripe gonads in his material. His best catches were made at the Flannan and Sulisker fishing grounds from February to April.

Our data for black scabbard coordinate well with Bridger's results. Good catches can be made all year round at Rosemary Bank, and at the Flannan and Sulisker fishing grounds, at a depth of 550-700 m. The black scabbard is pelagic, living just above the ocean floor. The many specimens caught in the upper net of the 200' bottom trawl indicate that catches could be increased by using a pelagic trawl pulled just above the ocean floor.

The optimal depth for grenadier is about 800 m; the largest accumulations of this fish were encountered at Tory Bank and Lousy Bank.

The flatter area of the continental slope between 400 and 600 m is inhabited by greater silver smelt, the largest catches of which were made at Porcupine Bank and Sulisker, regardless of the season.

The largest concentrations of Hoplostethus atlanticus occurred at South Farm Bank and Rosemary Bank, at 1000-1200 m. Such concentrations were extremely rare and fishery conducted specifically for this species is therefore not possible in this region.

Hake is found only on the shelf and on the edge but not on the northerly banks. The best catches were made at 400 m at Porcupine Bank and 600 m in the Flannan fishing grounds.

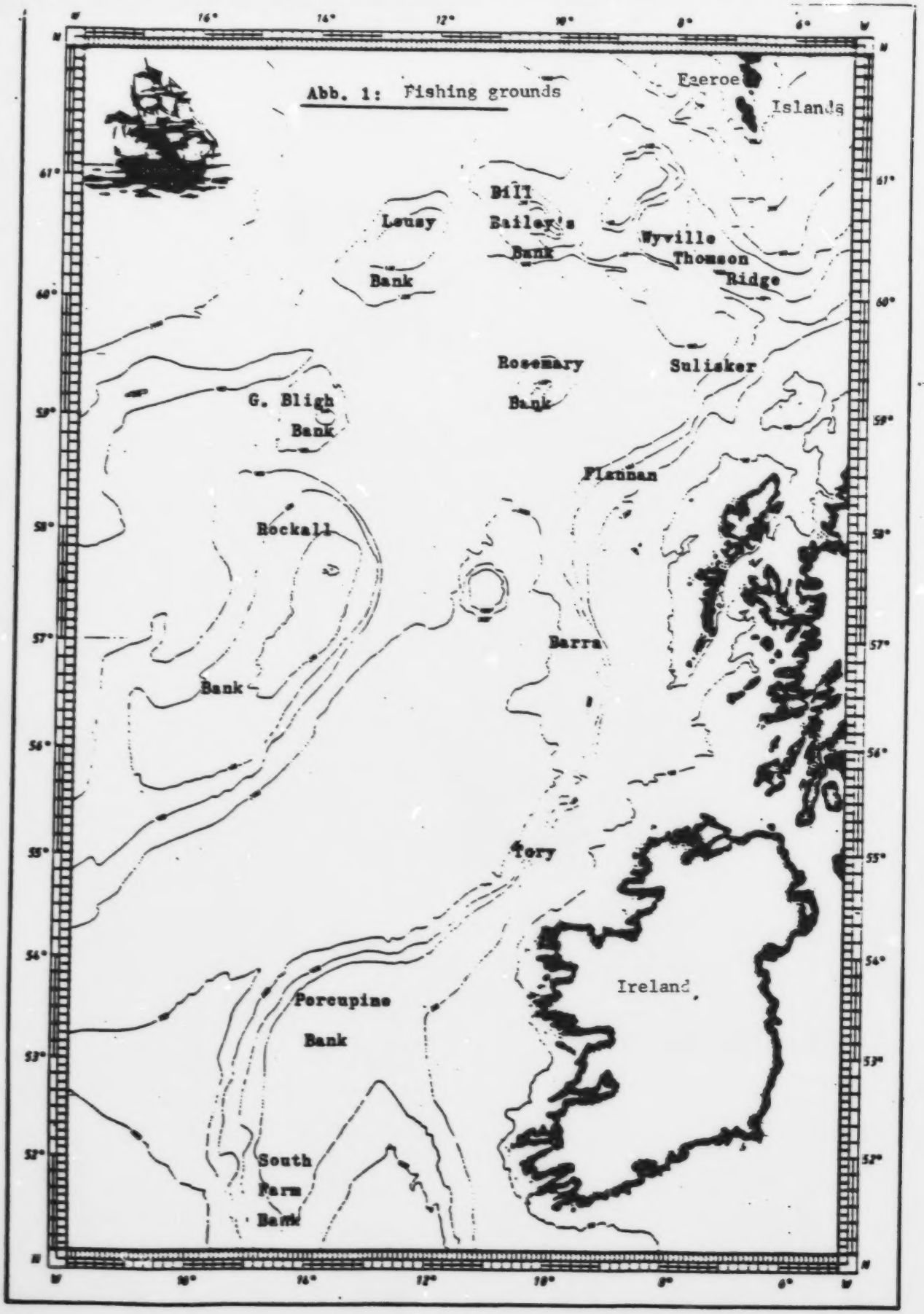
Abb. 1: Fishing grounds
Faeroe Islands
Bill Bailey's Bank
Lousy Bank
Wyville Thomson Ridge
Rosemary Bank
Sulisker
G. Bligh Bank
Flannan
Rockall
Barra
Bank
Tory
Ireland
Porcupine Bank
South Farn Bank

Table 1: Deep-sea fishing trips on the fishery research ship the "Walther Herwig"

Trip No.	Time period
10	04.05. - 05.06.1974
14	04.11. - 16.12.1974
17	23.04. - 21.05.1975
34	07.06. - 28.06.1979
38	08.01. - 07.02.1980 11.02. - 18.03.1980
47	22.09. - 22.10.1981
50	02.02. - 12.03.1982
58	02.05. - 01.06.1983

Table 2: Number of catches per fishing ground and the depths at which they were made

Fishing ground	No. of catches (n)	Depth range (m)
South Farn Bank	17	400-1500
Porcupine Bank	39	400-1400
Tory	20	400-1220
Barra	21	400-1210
Flannan	27	400-1200
Sulisker	20	400-1200
Rosemary Bank	20	450-1230
B. Bailey's Bank	35	400-1220
Lousy Bank	52	400-1250
G. Bligh Bank	14	470-1240
Rockall Bank	47	400-1245
Total	312	

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Translation of foreign-language titles:

2. Results of bottom fishing from January to March 1980 on the continental shelf of western Europe.
3. Preliminary results from the 6th deep-sea fishing trip to the Rockall Trough area west of Ireland and the British Isles.
4. Blue ling stocks in the northern sector of the Rockall Trough, biological studies conducted for fishery purposes.
5. Results of further studies of fish stocks on the continental slope of western Europe.
6. Exploiting new fishing grounds and commercially viable fish stocks in the northeast Atlantic.
7. Further investigations into exploiting new fish stocks on the continental shelf of western Europe.

8. Qualitative and quantitative investigations of ichthyocenosis in the archibenthic zone of the Rockall Trough and surrounding banks.

9. Possible new commercially useful fish and the fishing grounds for them in the northeast Atlantic.

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